

# POWER RELAY

## 1 POLE - 3A/5A, SLIM TYPE

### FTR-F3 Series

RoHS Compliant

#### ■ FEATURES

- High density mounting  
Slim type with 7mm width and 142mm<sup>2</sup> mounting space
- High insulation  
Insulation distance: minimum 6mm between coil and contact  
Dielectric strength: 4,000V  
Surge strength: 10,000V
- Glow wire compliant type available which satisfies GWT required for relay in IEC/EN60335-1
- Cadmium free contact for eco-program
- Safety standards
- UL, CSA, VDE, CQC
- Plastic sealed relay, RTIII
- RoHS compliant



#### ■ APPLICATIONS

Control of factory automation equipment, home appliances etc.

#### ■ PART NUMBERS

[Example] FTR-F3   A   A   012   E   -   HA   -   GW  
                   (a)       (b)   (c)   (d)   (e)       (f)       (g)

|     |                       |   |
|-----|-----------------------|---|
| (a) | Relay type            | FTR-F3 series   |
| (b) | Contact configuration | A : 1a (1 Form A, SPST-NO)  |
| (c) | Coil type (power)     | A : 200mW   |
| (d) | Coil rated voltage    | 012 : 5....24VDC<br>Please refer to coil rating table                                       |
| (e) | Contact material      | E : AgNi  |
| (f) | Contact rating        | Nil : 3A type flux free<br>HA : 5A type sealing confirmed<br>KS : 5A type sealing confirmed |
| (g) | Special type          | GW : Comply with GWEPT (IEC60695-2-11)  |

Actual marking does not carry the type name : "FTR"

E.g.: Ordering code: FTR-F3AA012E-HA Actual marking: F3AA012E

HT marking not part of type number printing but next to coil rating print.

## ■ SPECIFICATIONS

| Item         |                                   |                  | Specifications                           |                                       | Remarks/Conditions                       |
|--------------|-----------------------------------|------------------|--|---------------------------------------|--|
|              |                                   |                  | FTR-F3AA( )E                             | FTR-F3AA( )E-HA                       |  |
| Contact Data | Configuration                     |                  | 1a (1 Form A, SPST)                      |                                       |  |
|              | Construction                      |                  | Single                                   |                                       |  |
|              | Material                          |                  | AgNi                                     |                                       |  |
|              | Resistance                        |                  | Max. 100mΩ                               |                                       | Initial at 1A, 6VDC                      |
|              | Contact rating                    |                  | 3A, 125VAC/30VDC                         | 5A, 250VAC/30VDC                      | Resistive                                |
|              | Max. carrying current             |                  | 5A                                       |                                       |  |
|              | Max. switching voltage            |                  | 277VAC/30VDC                             |                                       |  |
|              | Max. switching power              |                  | 750VA/90W                                | 1,250VA/150W                          |  |
|              | Min. switching load <sup>*1</sup> |                  | 10mA, 5VDC                               |                                       |  |
| Coil         | Rated power (20°C)                |                  | 200mW                                    |                                       |  |
|              | Operate power                     |                  | 113mW                                    |                                       |  |
|              | Operating temperature range       |                  | -40 °C to +70 °C                         |                                       | No frost                                 |
| Time         | Operate                           |                  | Max. 10ms                                |                                       | Without bounce, no diode                 |
|              | Release                           |                  | Max. 10ms                                |                                       | Without bounce, no diode                 |
| Life         | Mechanical                        |                  | Min. 5 x 10 <sup>6</sup> operations      |                                       |  |
|              | Electrical                        |                  | Min. 200 x 10 <sup>3</sup> operations    | Min. 100 x 10 <sup>3</sup> operations | At rated load                            |
| Insulation   | Insulation resistance             |                  | Min. 1,000MΩ                             |                                       | At 500VDC                                |
|              | Dielectric strength               | Open contacts    | 750VAC (50/60Hz) 1min                    |                                       |  |
|              |                                   | Coil to contacts | 4,000VAC (50/60Hz) 1min                  |                                       |  |
|              | Surge strength                    | Coil to contacts | 10,000V / 1.2 x 50μs standard wave       |                                       |  |
|              | Clearance                         |                  | 6mm                                      |                                       |  |
|              | Creepage                          |                  | 6mm                                      |                                       |  |
|              | EN61810-1                         | Voltage          | 250V                                     |                                       |  |
|              |                                   | Pollution        | 2  |                                       |  |
|              |                                   | Material group   | III                                      |                                       |  |
| Others       | Vibration resistance              | Misoperation     | 10 to 55 to 10Hz single amplitude 0.75mm |                                       | Coil ON/OFF, 3 axis, total 6 cycles      |
|              |                                   | Endurance        | 10 to 55 to 10Hz single amplitude 0.75mm |                                       | Coil OFF, 3 axis, total 6 hours          |
|              | Shock resistance                  | Misoperation     | Min. 100m/s <sup>2</sup> (11±1ms)        |                                       | Coil ON/OFF, 3 axis, total 36 operations |
|              |                                   | Endurance        | Min. 1,000m/s <sup>2</sup> (6 ±1ms)      |                                       | Coil OFF, 3 axis, total 18 operations    |
|              | Dimensions / Weight               |                  | 7.0 x 20.3 x 15.0 mm / approx. 4g        |                                       |  |
|              | Sealing                           |                  | Plastic sealed RTIII                     |                                       |  |

\*1: Minimum switching loads mentioned above are reference values. Please perform the confirmation test with actual load before production since reference values may vary according to switching frequencies, environmental conditions

## ■ COIL DATA

| Coil Code | Rated Coil Voltage (VDC) | Coil Resistance $\pm 10\%$ ( $\Omega$ ) | Must Operate Voltage (VDC) | Must Release Voltage (VDC) | Rated Power (mW) |
|-----------|--------------------------|---|----------------------------|----------------------------|------------------|
| 005       | 5                        | 125                                     | 3.75                       | 0.5                        | 200              |
| 006       | 6                        | 180                                     | 4.5                        | 0.6                        |                  |
| 009       | 9                        | 405                                     | 6.75                       | 0.9                        |                  |
| 012       | 12                       | 720                                     | 9                          | 1.2                        |                  |
| 018       | 18                       | 1,620                                   | 13.5                       | 1.8                        |                  |
| 024       | 24                       | 2,880                                   | 18                         | 2.4                        |                  |

Note 1: All values given in the coil table(s) are valid at 20°C ambient temperature, at zero contact current, without pre-energizing and are specified at pulse wave voltage.

Note 2: When applying a higher than rated coil voltage, please refer to the "coil temperature rise" and "operating range". Reference graphs for the effects on the relay operating behaviour.

## ■ SAFETY STANDARDS

| Type | Compliance   | Contact Rating  |  |
|------|--|---|--|
|      |  | FTR-F3AA( )E  | FTR-F3AA( )E-HA  |
| UL   | Flammability: UL 94-V-0 (plastics)   |   |  |
|      | UL60947-1, UL60947-4-1<br>File No. E63614  | [Certified part number: FTR-F3AA( )E]<br>5A, 277VAC/30VDC (resistive)<br>6A, 277VAC (resistive)<br>3A, 277VAC/30VDC (resistive) | [Certified part number: FTR-F3AA( )E]<br>3A, 277VAC/30VDC (resistive)<br>6A, 277VAC (resistive)<br>5A, 277VAC/277VAC (resistive) |
| CSA  | C22.2 No. 14<br>File No. LR 40304  | 1/10 HP, 125VAC<br>1/8 HP, 277VAC<br>Pilot duty: D300   | 1/10 HP, 250VAC (UL only),<br>1/10HP 125VAC<br>1/8 HP, 277VAC<br>Pilot duty: D300  |
| VDE  | IEC/EN61810-1  | 3A, 250VAC, $\cos\phi = 1$<br>3A, 30VDC, L/R=0ms  | 5A, 250VAC, $\cos\phi = 1$<br>5A, 30VDC, L/R=0ms   |
| CQC  | GB/T21711.1,<br>GB4943.1; IEC61810-1<br>File No. 10002049449,<br>04001010925,<br>17002164382 | 3A, 250VAC/30VDC 5A<br>(except-KS type)   | 5A 250VAC/30VDC  |

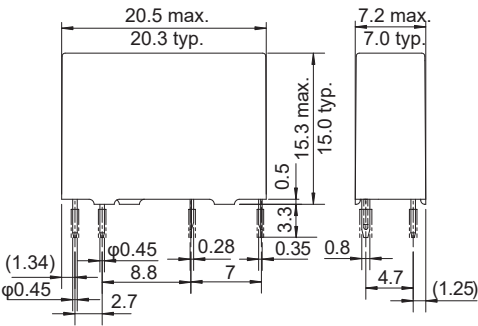
The part numbers on the safety standards' certifications and the ordering part numbers may differ. Coil code is in ( ).

## ■ PART NUMBER LIST

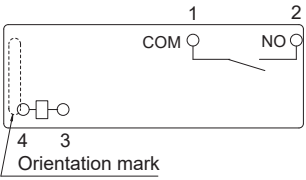
| Part Number        | Contact Configuration | Rated Power   | Contact Material | Contact rating      | Special type                       |
|--------------------|-----------------------|---------------|------------------|---------------------|------------------------------------|
| FTR-F3AA( )E       | 1a (1 Form A)         | Approx. 200mW | AgNi             | 3A,<br>125VAC/30VDC | -                                  |
| FTR-F3AA( )E-KS    |                       |               |                  |                     | Plastic seal                       |
| FTR-F3AA( )E-GW    |                       |               |                  |                     | Comply with GWEPT                  |
| FTR-F3AA( )E-KS-GW |                       |               |                  |                     | Plastic seal,<br>comply with GWEPT |
| FTR-F3AA( )E-HA    | 1a (1 Form A)         | Approx. 200mW | AgNi             | 5A,<br>250VAC/30VDC | -                                  |
| FTR-F3AA( )E-HA-GW |                       |               |                  |                     | Comply with GWEPT                  |

## ■ DIMENSIONS

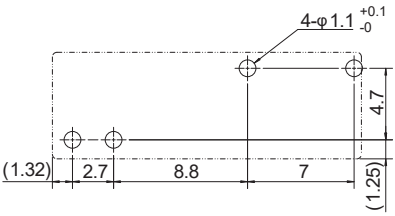
Dimensions



Schematics  
(BOTTOM VIEW)



PC board mounting hole layout  
(BOTTOM VIEW)



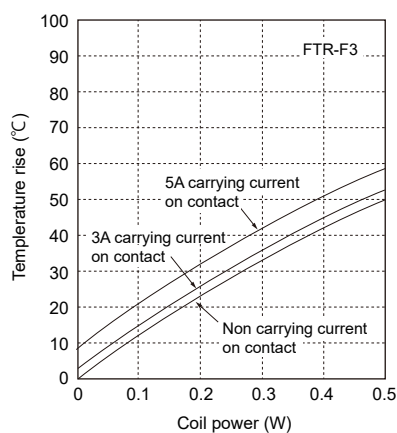
- Dimensions of the terminals do not include thickness of pre-soldering.
- Tolerance of PC board mounting hole layout :  $\pm 0.1$  unless otherwise specified.

Unit: mm  
( ) : Reference

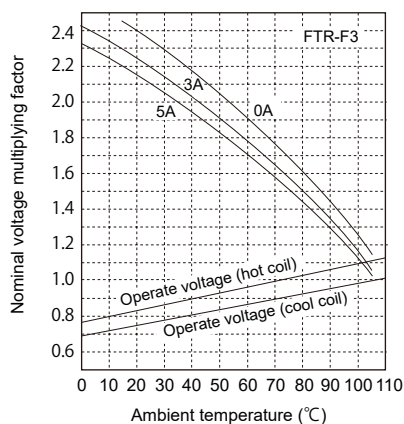
## ■ CHARACTERISTIC DATA

(Characteristic data is not guaranteed value but measured values of samples from production line.)

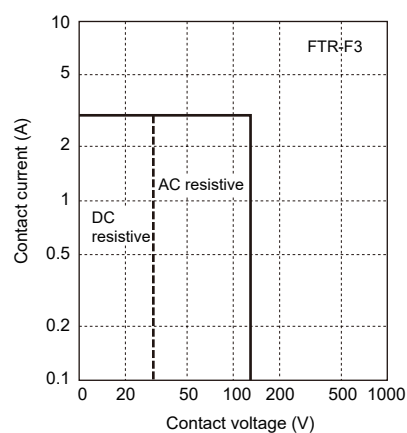
### Coil temperature rise



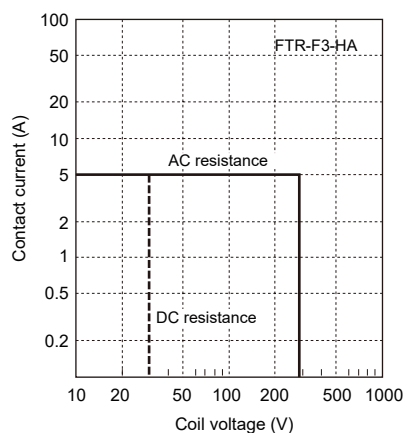
### Operating range



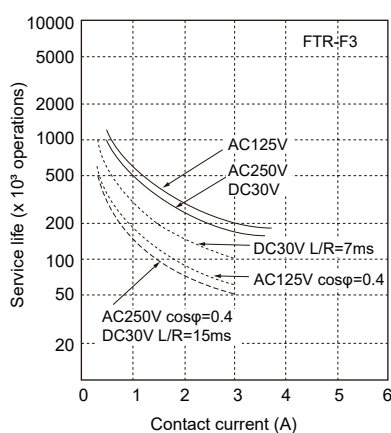
### Maximum switching power



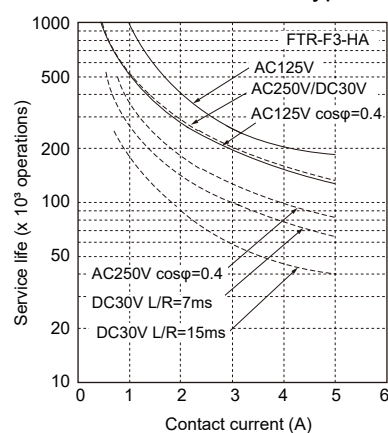
### Maximum switching power



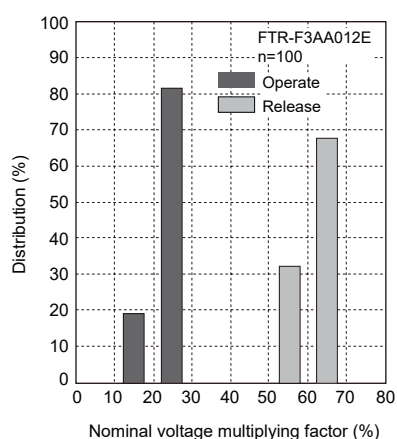
### Life curve - 3A type



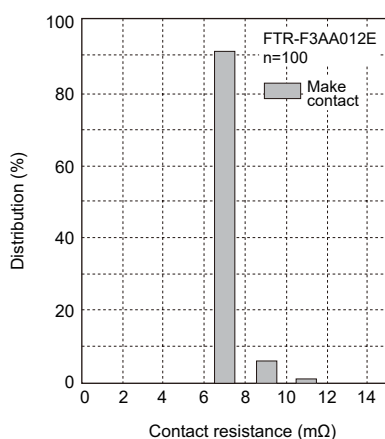
### Life curve - 5A type



### Distribution of operate/release voltage



### Distribution of contact resistance



## CAUTIONS

- All values mentioned in this datasheet are provided under ideal conditions. Please perform the confirmation test before actual use.
- Reflow soldering is prohibited.
- Do not use relays in the atmosphere with sulfide gas, chloride gas or nitric oxide. Contact resistance may increase.
- Do not use silicon or silicon-containing product or materials near relays. It may cause contact failure.

## GENERAL INFORMATION

### 1. ROHS Compliance

- All relays produced by FCL Components are compliant with RoHS directive 2011/65/EU, including commission delegated directive 2015/863.

### 2. Recommended lead free solder condition

- Lead free solder plating on relay terminals is Sn-3.0Ag-0.5Cu, unless otherwise specified. This material has been verified to be compatible with PbSn assembly process.
- Recommended solder for assembly: Sn-3.0Ag-0.5Cu.

#### Flow Solder Condition:

Pre-Heating: Maximum 120°C within 90 sec.

Soldering: Dip within 5 sec. at 255°C±5°C solder bath

Relay must be cooled by air immediately after soldering

#### Solder by Soldering Iron:

Soldering Iron: 30-60W

Temperature: Maximum 340-360°C

Duration: Maximum 3 sec.

**We highly recommend that you confirm your actual solder conditions**

### 3. Moisture Sensitivity

- Moisture Sensitivity Level standard is not applicable to electromechanical relays, unless otherwise indicated.

### 4. Tin Whiskers

- Dipped SnAgCu solder is known as presenting a low risk to tin whisker development. No considerable length whisker was found by our in house test.

## Contact

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